CLAIMS

1. Carousel machine for the treatment of hollow containers, of the type involving several identical treatment stations (12, 13) whose purpose is to treat at least one hollow container, and of the type in which, for at least one stage of treatment, the treatment station is connected to a pressure source by means of a distribution device involving a sealed swivel coupling,

characterized in that, for the said stage, the machine comprises at least two sources of independent and equivalent pressure (A1, A2), and that the stations are distributed into as many groups (12, 13) as the machine involves sources, and in that the means of distribution (18) are such that each source (A1, A2) is associated with a distinct group.

2. A machine according to Claim 1, characterized by the means of distribution being such that, at any instant, one of the said sources is connected to, at the most, one station.

3. Machine according to any of the preceding claims, characterized in that the means of distribution (18) are such that at least one station (12) of a group might be connected to an associated source (A1), while at least one station (13) of another group is connected to its own associated source (A2).

4. Machine according to any of the preceding claims, characterized in that the swivel coupling involves as many routes as the machine has sources for separately feeding the groups of stations, and in that the means of distribution include, downstream of the rotating coupling, some individual valves associated with each station.

5. Machine according to any of the preceding claims from 1 though 3, characterized in that the sealed swivel coupling is realized under the form of a rotating distributor (18) involving two coaxial crowns,

the one stationary (20) and the other rotating (22), which are in contact with each other in a sealed manner at adjacent contact surfaces (24, 26), in that the rotating crown (22) involves some communication ports (28, 29), which are each connected to a station (12, 13), which are distributed in at least as many series as the machine has sources for the said stage; and which terminate in the contact surface (26) of the rotating crown (22), and in that the ports of one same series, all correspond to stations of one same group, and follow the same trajectory, while the ports of the two different series follow different trajectories, in that the stationary crown (20) implies some lights (34, 35) which are connected to a pressure source (A1, A2), each of which terminates at the contact surface (24) of the stationary crown (20) in such a way as to be on the trajectory of a series of ports (28, 29) of the rotating crown (22), of such a kind that one station is connected to a pressure source when the corresponding port is to be found in line with a light associated with this source, in that the stationary crown implies at least as many distinct series of at least one light, as the number of the series of ports, and in that the two sources of pressure (A1, A2) are each connected to a light of two distinct series of lights (34, 35) of the stationary crown (20).

6. Machine according to Claim 5, characterized in that the ports (28, 29) of all the stations (12, 13) of one same group, belong to the same series.

7. Machine according to Claim 6, characterized in that the contact surfaces (24, 26) of the two crowns (20, 22) are annular faces perpendicular to the axis of rotation (X-X) of the carousel (16).

8. Machine according to Claim 7, characterized in that the ports (28, 29) of one same series are positioned along a circle, and in that the two series of ports (28, 29) are positioned according to two circles of different diameters.

9. Machine according to Claim 8, characterized in that the ports (28, 29) of one same series are distributed angularly in a regular fashion

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around the axis of rotation (X-X) of carousel (16), and in that the ports (28, 29) of two different series involving the same number of ports are intercalated angularly.

10. Machine according to one of the claims 8 or 9, characterized in that the lights (34, 35) corresponding to two independent and equivalent sources of pressure (A1, A2), and utilized for said stage, are fitted with an angular displacement (α) and on different diameters, corresponding respectively to the diameters of circles according to which the series of ports (28, 29) are fitted, corresponding to the said sources.

11. Machine according to Claim 10, characterized in that two consecutive ports of one same series are angularly separated by an angular displacement (β) at least equal to the angular displacement (α) on which is mounted the corresponding light of the said series.

12. Machine according to any of the claims 5 through 11, characterized by the fact that this treatment implies a second stage, during which the treatment stations (12, 13) are connected, by means of a rotating distributor (18), with the secondary sources of pressure (B1, B2) to attain a second level of pressure, in that the stationary crown (20) involves, by extending each of the first lights (34, 35), secondary lights (36, 37) which are connected each to a second pressure source (B1, B2), and that the two lights ([34, 36], [35, 37]) associated with the same series of ports (28, 29) are separated by an angular displacement (δ) which prevents the simultaneous connection of one port with two lights.

13. Machine according to any one of the preceding claims, characterized in that the sources of pressure (A1, A2) are at a pressure less than atmospheric pressure.

14. Machine, according to any one of the claims above, characterized in that the treatment includes a stage

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for which a cold, low-pressure plasma is created, for the purpose of coating the hollow container, in that the treatment includes at least one pumping stage for lowering the internal pressure of the treatment station, and in that the independent and equivalent pressure sources which allow for the realization of the pumping stage, consist of at least two pumps (A1, A2).

15. Rotating distributor for a carousel machine for treatment of hollow containers, the machine involving several identical treatment stations (12, 13) each one designed to treat at least one hollow container, of the type in which the distributor (18) implies two coaxial crowns, the one stationary (20) and the other rotating (22), which are in contact with each other in a sealed manner, by way of adjacent contact surfaces (24, 26), of the type in which the rotating crown (22) involves communication ports (28, 29) which are each designed to be connected to a station, and which terminate on the contact surface of the rotating crown, and of the type in which the stationary crown (20) involves at least one light which is designed to be connected to a pressure source of the machine, and which terminates on the contact surface of the stationary crown in such a way as to be on the trajectory of the ports of the rotating crown, in such a way that one station is connected to the pressure source when the corresponding port finds itself in line with the light,

characterized in that the ports of the rotating crown are distributed into at least two series (28, 29), in that the ports of one same series follow the same trajectory while the ports of two different series follow different trajectories, in that the stationary crown (20) implies as many distinct series of at least one light, as the number of the series of ports, each of the lights being fitted on the trajectory of one of the series of ports, and in that the two independent and equivalent pressure sources are each connected to one light of two distinct series.

16. Distributor according to Claim 15, characterized in that the contact surfaces (24, 26) of the two crowns are annular faces, perpendicular to the axis of rotation (X-X) of the rotating crown (22).

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17. Distributor according to Claim 16, characterized in that the ports (28, 29) of one same series are fitted along a circle, and in that the two series of ports are fitted according to two circles of different diameters.

18. Distributor according to any one of the claims from 15 through 17, characterized in that the ports (28, 29) of one same series are distributed angularly in a regular manner around the axis of rotation (X-X), and in that the ports of the two different series involving the same number of ports are intercalated angularly.

19. Distributor according to one of the claims 17 or 18, characterized in that the lights (34, 35) corresponding to two sources of pressure (A1, A2) are fitted on the same angular displacement (α) and on the different diameters corresponding respectively to the diameters of the circles according to which are fitted the series of ports (28, 29) corresponding to the said sources.

20. Distributor according to one of the claims 17 through 19, characterized in that two consecutive ports of one same series (28, 29), are separated by an angular displacement (β) at least equal to the angular displacement (α) on which is fitted the light (34, 35) corresponding to the said series of ports.

21. Distributor according to any one of the claims 15 through 20, characterized in that the stationary crown includes, for each series of lights, at least two more lights (34, 36), the one following the other, and in that these two lights (34, 36) of one same series, are separated by an angular displacement (δ) preventing the simultaneous connection one port with two lights.